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YUKON AREA COMMERCIAL, SUBSISTENCE, AND PERSONAL USE SALMON FISHERIES 1991 MANAGEMENT PLAN

By

Alaska Department of Fish and Game
Division of Commercial Fisheries
Arctic-Yukon-Kuskokwim Region

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INTRODUCTION

This management plan was developed to inform fishermen, processors and other interested persons of the status of the 1991 Yukon River salmon runs and strategies that may be used to manage the various salmon fisheries. The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial, subsistence, and personal use fisheries in the Yukon Area. Five species of Pacific salmon occur in the Yukon River, with chum salmon being the most abundant. The chum salmon return is made up of an early (summer chum) run and a later (fall chum) run.

The Yukon Area includes all waters of the Yukon River drainage in Alaska and coastal waters from Canal Point Light, near Cape Stephens, to the Naskonat Peninsula. For management purposes, the area is divided into six districts and 10 subdistricts (Figure 1). Commercial and subsistence fishing occurs along the entire 1,200 mile length of the Yukon River in Alaska, and in the lower 220 miles of the Tanana River. The Lower Yukon Area (Districts 1, 2 and 3) includes the coastal waters of the delta and that portion of the drainage from the mouth to Old Paradise Village (river mile 301). The Upper Yukon Area (Districts 4, 5 and 6) is that portion of the drainage upstream of Old Paradise Village to the US/Canada border, including the Tanana River drainage. Commercial and subsistence fisheries also occur in Canada, with fishery management activities conducted by the Canadian Department of Fisheries and Oceans (DFO).

Subsistence use has the highest priority among beneficial uses of the resource. A majority of the commercial fishermen take salmon for both commercial and subsistence purposes. In order to enforce commercial fishing regulations, it is necessary to place some restrictions on the subsistence fishery. During the fishing season, however, substantially more fishing time is allowed for subsistence than for commercial purposes.

In 1986, the subsistence law was amended to limit subsistence hunting and fishing to rural Alaska residents. To allow continued participation in salmon fisheries by residents of non-rural communities, the Alaska Board of Fisheries created personal use salmon fisheries. In December 1989, the Alaska Supreme Court overturned the 1986 subsistence law as unconstitutional, and since July 1, 1990, all state residents qualify as subsistence users. However, personal use fishing regulations still exist, therefore, fishermen may request a personal use permit if they so desire. Personal use fishermen are required to secure a fishing permit from the local ADF&G office and to possess a resident sport fishing license. Salmon taken for personal use may be used only for human consumption and bait.

Management of the Yukon River commercial salmon fishery is complex because of the difficulty in determining run size, harvesting of mixed stocks, increasing efficiency of the commercial fleet, and allocation issues. Additionally, management must be conservative to provide for escapement and subsistence requirements. The overall goal of the Department's research and management program is to manage the various salmon runs for optimum sustained yield under

the policies set forth by the Alaska Board of Fisheries. However, escapement levels required to produce maximum sustained yields cannot be determined at this time due to the lack of an adequate database. Current escapement objectives in the Yukon River drainage are based on historic escapement trends in key spawning index areas which are surveyed or counted annually. The average historic escapement level for each index area is considered a minimum objective to be met or exceeded each season.

Due to the mixed stock nature of the fishery, some tributary populations may be under- or over-harvested in relation to their actual abundance. Based on current knowledge, it is impossible to manage individual stocks independently, and there is concern that some spawning populations may be reduced to very low levels. Primary management tools are guideline harvest ranges established by the Alaska Board of Fisheries, and emergency orders, which are used to open and close the commercial fishing seasons, establish fishing period frequency and duration, and establish mesh size restrictions. In general, based upon evaluation of run abundance, the Department attempts to manage the salmon fisheries such that each district's harvest is similar proportionately within their respective guideline harvest ranges.

STATUS OF STOCKS AND FISHERY

Chinook Salmon

The Yukon River commercial salmon fishery in Alaska dates back to 1918. Commercial chinook salmon catches have ranged from 64,000 to 158,000 fish since 1961 (Table 1), and the recent 5-year average (1985-1989) is 116,800 fish (lower river districts 110,200, upper river districts 6,600). The majority of the commercial harvest occurs in Districts 1 and 2. The commercial fishery in Canada harvests an average of 11,400 chinook salmon annually (1985-1989) (Table 3). Throughout the Yukon River drainage, the recent 5-year average chinook salmon subsistence harvest is approximately 55,000 fish (Tables 2 and 3).

Chinook salmon spawning stocks are widely distributed throughout the Yukon River drainage (Tables 4 and 5). Information acquired through scale pattern analysis (SPA), genetic stock identification (GSI), and tagging studies indicate that Canadian chinook salmon stocks have undergone unacceptably high harvest rates in recent years. These harvest rates were estimated to range from 61% to 91% in recent years. Based on studies in other areas, harvest rates in excess of 67% will likely result in a serious decline in chinook salmon abundance; this situation must be offset by reduced harvests to ensure adequate escapements are achieved.

Exploitation rates cannot be accurately estimated at this time for Alaskan chinook salmon stocks due to the lack of reliable total population estimates. Aerial survey escapement data indicate that spawning escapement objectives for middle river stocks (primarily Tanana River drainage) have not been met during some recent years, however, escapement objectives for lower river stocks (Yukon River drainage below the Koyukuk River) have generally been achieved in recent years.

It is possible that chinook salmon commercial harvests in Alaska will be below the mid-point of the guideline harvest ranges during the 1991-1993 seasons due to the relatively low escapements of Canadian stocks in the 1985-1987 parent years.

Summer Chum Salmon

Summer chum salmon commercial harvests have greatly increased during the past decade. The recent 5-year average (1985-1989) commercial harvest is 758,000 fish in-the-round and 237,000 pounds of roe (Table 1). The majority of the commercial harvest takes place in Districts 1, 2, and 4. The District 4 fishery has become primarily a salmon roe fishery. Approximately 279,000 summer chum salmon are taken annually (1984-1988 average) for subsistence use throughout the drainage (Table 2).

The Andreafsky and Anvik Rivers are the major summer chum salmon-producing rivers (Table 6). Escapements of over one million summer chum salmon have been documented in the Anvik River. The Koyukuk, Nulato, and Tanana Rivers are also important summer chum salmon-producing systems. Summer chum salmon escapements were generally fair to good in 1988 and 1989, however, relatively poor escapements occurred in 1987 and 1990.

Fall Chum Salmon

The 1985-1989 average commercial harvest in Alaska was 162,000 fall chum salmon (Table 1), while in Canada, approximately 27,000 have been taken annually (Table 3). Approximately 190,000 fall chum salmon have been taken annually (1985-1989 average) for subsistence use throughout the drainage (Tables 2 and 3).

Fall chum salmon enter the lower Yukon River from mid-July through early September. Major spawning areas are located in the Tanana and the Porcupine River drainages, and the Canadian portion of the Yukon River (Table 7). Historical tagging studies conducted near Galena and Ruby indicated that the early segment of fall chum salmon may be bound primarily for the Porcupine River and Canadian portion of the Yukon River. The later segment of the fall chum salmon run, although likely mixed with other stocks, is believed to be destined primarily for the Tanana River drainage. Stock identification studies using protein genetics are presently underway to improve our understanding of fall chum salmon timing by spawning stock in the lower river fishery.

During the 1980's, there was concern for the health of fall chum salmon stocks because of spawning escapements below objective levels from 1982 through 1984. Additional regulatory restrictions adopted by the Board of Fisheries in 1983 and 1986 resulted in generally improved spawning escapements during the late 1980's. However, the Toklat River stock and the Yukon River mainstem stock in Canada have shown less improvement than other spawning areas.

Coho Salmon

Typically, coho salmon are taken incidentally to the more numerous fall chum salmon. The 1985-1989 average Alaskan commercial catch is approximately 55,000 fish (Table 1). The commercial harvest of coho salmon is dependent upon the

timing of the fall chum salmon fishing season. Annual subsistence catches throughout the drainage are approximately 52,000 fish.

Coho salmon begin entering the Yukon River during early August and the run continues into September. Spawning occurs discontinuously throughout the drainage with the largest known spawning concentrations documented in tributaries of the upper Tanana River drainage (Table 8).

U.S./Canada Treaty Negotiations

There have been treaty negotiations between the U.S. and Canada regarding chinook and chum salmon originating in the Canadian portion of the drainage since 1985. At negotiations held in March and April, 1990, the Parties reached a tentative agreement for Canadian harvest shares during run rebuilding. Canada would endeavor to manage the harvest of chum salmon in the mainstem Yukon River drainage in Canada within a guideline harvest range of 23,600 in years of weak returns and 32,600 in years of strong returns. In addition, Canada would endeavor to manage the harvest of chinook in the mainstem Yukon River drainage in Canada within a guideline harvest range of 16,800 in years of weak returns and 19,800 in years of strong returns. Note that these harvests include both commercial and non-commercial catches.

The Parties also reached a tentative agreement on a minimum spawning escapement objective of 18,000 for the Canadian mainstem chinook salmon stock for six years beginning in 1990. During this period of time the U.S. would endeavor to deliver annually between 34,800 and 37,800 chinook salmon to the Canadian border on the mainstem Yukon River. These agreements would not become legally binding until a treaty between the two nations is ratified. A spawning escapement objective of 80,000 fish has been agreed to for Canadian mainstem chum salmon by the Joint Technical Committee.

OUTLOOK FOR 1991

Chinook Salmon

The majority of chinook salmon returning to the Yukon River are 6-year-old fish; however, 5- and 7-year-old fish make a significant contribution to the run. In general, spawning escapements in 1985, the primary brood year (age 6 in 1991), were judged to be below average in magnitude in Canada, and average in Alaska. It is expected that the 1991 return of 5-year-olds will be average based on escapements which ranged from below average in Canada to above average in Alaska during 1986, and above average proportion of 4-year-old fish in the 1990 return. The return of 7-year-old fish (1984 year class) is expected to be average as the return of this year class in 1990 as 6-year-olds was average. Overall, the 1991 chinook salmon return is anticipated to be below average to average in strength. The commercial harvest in Alaska is expected to total 83,000 to 100,000 chinook salmon (77,000-93,000 fish in the Lower Yukon Area, 6,000-7,000 fish in the Upper Yukon Area).

Summer Chum Salmon

Summer chum salmon return primarily as 4-year-old fish, although substantial 5-year-old returns can result from brood years with high survival rates. The return of 4-year-old fish in 1991 will be dependent on production from the 1987 brood year. Based on available catch and escapement data, the magnitude of the 1987 summer chum salmon run was judged to be below average in abundance. In addition, the return of 5-year-old fish in 1991 is expected to be below average in strength based upon the below average return of 4-year-old fish in 1990. In summary, based on evaluation of brood year run size data and assuming average survival, it is expected that the Yukon River summer chum salmon return in 1991 will be below average in magnitude. The commercial harvest is expected to be near the lower end of the river-wide guideline harvest range (400,000-600,000 fish; 70,000-100,000 pounds of roe).

Fall Chum Salmon

Similar to summer chum salmon, fall chum salmon return primarily as 4-year-old fish. Escapements in 1987 (the brood year which will produce 4-year-old fish in 1991) were generally above average. This suggests an average to above average return of 4-year-olds in 1991. The return of 5-year-old fish (1986 brood year) is expected to be below average, overall, based on the low contribution of age 4 fall chum salmon in the 1990 harvest, and the below average to average escapements in 1986. In summary, based on evaluation of brood year escapements, and assuming average survival rates, the overall fall chum salmon return is expected to be average to above average in 1991. The commercial harvest is anticipated to range from 200,000 to 300,000 fall chums (approximately 140,000-206,000 in the Lower Yukon Area, and 60,000-94,000 fall chum and coho salmon combined in the Upper Yukon Area).

Coho Salmon

Coho salmon return primarily as 4-year-old fish. Comprehensive escapement information for coho salmon is lacking, but escapement surveys in the Tanana River system indicated above average run strength in 1987. The commercial harvest is expected to approach 90,000 fish, and will be dependent on the timing and frequency of fishing periods allowed for fall chum salmon.

MANAGEMENT STRATEGY - LOWER YUKON AREA (DISTRICTS 1, 2, AND 3)

Commercial Fisheries

Chinook and Summer Chum Salmon

Management of the chinook and summer chum salmon runs is made difficult by the overlapping run timing of these species. The harvest of summer chum salmon, for example, can be largely a function of management strategies and actions applied to the chinook salmon fishery. The chinook and summer chum salmon harvests are managed by field announcement to schedule season openings and closures, fishing

periods and gill net mesh size restrictions. The Alaska Board of Fisheries has established a chinook salmon guideline harvest range of 60,000 to 120,000 fish for Districts 1 and 2 combined, and 1,800 to 2,200 for District 3. The guideline harvest range for summer chum salmon is 251,000 to 755,000 fish for Districts 1 and 2 combined, and 6,000 to 19,000 fish for District 3.

The directed commercial chinook salmon fishery will open by emergency order on a staggered basis beginning with District 1, when increasing subsistence and/or test-net catches have occurred over a 7 to 10 day period. This strategy of allowing the early portion of the run to build, prior to commercial fishing, provides for uninterrupted subsistence fishing in the Lower Yukon Area, and allows passage of a portion of the early run segment out of the lower Yukon districts. The fish that pass out of the lower districts are bound primarily for middle and upper river areas and are subject to intensive harvest pressure along the entire course of their migration.

Unrestricted mesh size fishing periods are anticipated to be 12 hours in duration. In District 1, fishing periods will begin at 6:00 p.m. on Mondays and Thursdays and continue until 6:00 a.m. the following day. In Districts 2 and 3, fishing periods will begin at 6:00 p.m. Wednesdays and Sundays and continue until 6:00 a.m. the following day.

Test fishing, commercial catch rates, age composition, and Pilot Station sonar counts will be monitored to judge salmon run abundance and timing. If run strength and harvest levels develop as anticipated, the use of unrestricted mesh size gill nets will cease when the combined Districts 1 and 2 harvest approaches 60,000 chinook salmon. The harvest of chinook salmon in gill nets restricted to 6-inch maximum mesh size will be included in the guideline harvest range. It is expected that the total commercial harvest of chinook salmon will be approximately 75,000 to 90,000 fish for Districts 1 and 2 combined.

Beginning in 1985, summer chum salmon directed fishing periods have been implemented early in the season if the return: 1) is judged to be at least average in strength, and 2) occurs with similar timing to the chinook salmon return. Normally, these fishing periods are 6 to 12 hours in duration, and are established prior to or during the chinook salmon directed season. It is not anticipated that summer chum salmon directed fishing periods will be scheduled during this time period in 1991. Following the chinook salmon directed fishery, 6-inch maximum mesh size fishing periods are anticipated to be 12 hours in duration depending on the strength of the summer chum salmon return. As with other salmon stocks, an effort will be made to spread the harvest out over the run, so that no one segment is overexploited. The summer chum salmon harvest should be near the lower end of the guideline harvest ranges due to the anticipated weak return. There is a possibility that an unrestricted mesh size fishing period, or periods may be established during early July, if the summer chum return is very weak. This strategy would occur if further harvest of chinook salmon can be allowed and a lower exploitation rate on summer chum salmon is necessary.

The summer season commercial fishery will close July 15 or earlier depending on the magnitude of the run. The District 3 commercial fishing season may close

prior to the other districts because of lower marketability of fish late in the run and to provide for increased subsistence fishing opportunity. Since Districts 1 and 2 have combined guideline harvest ranges, the overall harvest level will determine when the directed chinook and summer chum salmon seasons end. It may not be possible to allow an equal amount of fishing time for each district.

Fall Chum Salmon

The fall chum salmon guideline harvest range for Districts 1, 2, and 3 is 60,000-220,000 fish. The Department will monitor in-season abundance using the lower Yukon test fishery, Pilot Station sonar, and subsistence catches. These data, in combination with the pre-season projection, will constitute the basis for decisions regarding management of these stocks. It is expected that the commercial fishing season will reopen during late July or early August. After the initial fishing period, subsequent openings will be based on commercial catch levels and fish passage by the Pilot Station sonar. The commercial harvest is expected to range from 140,000-206,000 fall chum salmon for Districts 1, 2, and 3 combined.

Period length will likely be 12 hours in the Set Net Only Area of District 1, and 6 hours duration in the remainder of the Lower Yukon Area. Fishermen will be required to register for the Set Net Only Area prior to the opening of the fall commercial fishing season. Fishing periods in the Set Net Only Area will probably be scheduled to occur over night, while fishing periods in the remainder of the Lower Yukon Area will be scheduled for daylight hours.

Coho Salmon

Coho and fall chum salmon runs overlap to a considerable extent. Because of this overlap, and because of the overriding importance of the fall chum run, the harvest of coho salmon will be a function of management strategies directed towards fall chum salmon.

Subsistence Fisheries

In the Lower Yukon Area, salmon may be taken by subsistence fishermen seven days per week until 24 hours prior to the opening of the commercial fishing season, and beginning 24 hours after the end of the commercial fishing season. During the commercial fishing season, subsistence fishing is allowed only during open commercial fishing periods. In addition, 24 hour subsistence only fishing periods will be established every other weekend during the commercial season through July 19, and each weekend during the fall commercial fishing season. If more subsistence fishing time is needed, subsistence only fishing periods will be announced by emergency order. Personal use fishing is open during the same times as subsistence fishing.

MANAGEMENT STRATEGY - UPPER YUKON AREA (DISTRICTS 4, 5, AND 6)

Commercial Fisheries

The Department of Fish and Game requires all processors and buyers of salmon to register with the Fairbanks office before purchasing salmon in the Upper Yukon Area. Registered salmon buyers are required to provide a verbal report of their salmon purchases within 18 hours following the closure of a commercial fishing period. Buyers are also required to mail or deliver fish tickets to the Fairbanks office within 36 hours following the closure of a commercial fishing period. The reporting of salmon purchases in a timely manner is essential for the management of these fisheries. If there is incomplete reporting, the department may delay commercial fishing periods until the needed harvest information is received.

In 1990, the department added new statistical reporting areas for Districts 4 and 5. Proper reporting of salmon harvests by statistical area aids the department in managing these complex fisheries. Informational packets with registration forms, maps, and processor reporting requirements are available from the Fairbanks Division of Commercial Fisheries office.

Regulation prohibits a commercial fisherman from transferring between the three Upper Yukon Area districts in-season. Fishermen accomplish district registration when they make the first delivery of the season. Fishermen can move freely between subdistricts within the registered district.

District 4

The District 4 commercial fishing season opens by regulation between June 15 and June 25. However, because of the projected below average summer chum salmon return, the department expects to open District 4 later than June 25 in 1991. The commercial salmon season in District 4 is anticipated to open on Wednesday, June 26. This strategy of delaying the opening of the season will allow distribution of the run throughout the district and reduce the harvest of earlier running spawning stocks.

Once the District 4 commercial salmon season is opened, regulations provide for two 48-hour commercial and subsistence fishing periods per week, from 6:00 p.m. Sunday until 6:00 p.m. Tuesday, and from 6:00 p.m. Wednesday until 6:00 p.m. Friday. However, if the summer chum salmon run for 1991 develops consistent with the below average projection, the department may alter the commercial fishing schedule in Subdistrict 4-A to allow only one 48-hour commercial fishing period per week. If this occurs, a second 48-hour subsistence only fishing period will be established each week.

Chinook and Summer Chum Salmon

In the Upper Yukon Area, the chinook and summer chum salmon season is often called the early season. The District 4 chinook salmon guideline harvest range is 2,250 to 2,850 fish. Based on preseason projections, the department will

manage for the lower end to mid-point of the chinook salmon guideline harvest range. The early season in District 4 will close when the targeted chinook or summer chum salmon harvest is reached.

The Subdistrict 4-A summer chum salmon guideline harvest range is 113,000 to 338,000 fish, or the roe equivalent of 61,000 to 183,000 pounds. Subdistricts 4-B and 4-C have a combined guideline harvest range of 16,000 to 47,000 summer chum salmon.

The Board of Fisheries has established a roe cap in Subdistrict 4-A of 183,000 pounds of roe. If Subdistrict 4-A salmon roe sales reach the cap during a fishing season, then only the sale of fish in the round will be allowed. Additionally, regulations require CFEC permit holders in Subdistrict 4-A to report all fish caught during commercial fishing periods on fish tickets. Reported fish include males and "stripped" females taken from commercial catches and used for subsistence purposes. This requirement is necessary to avoid double counting when conducting subsistence surveys, and to assist the department in obtaining accurate total catch figures.

Fall Chum and Coho Salmon

In the Upper Yukon Area, the fall chum and coho salmon season is often called the late season. Current regulations do not provide for a commercial late season for fall chum salmon in Subdistrict 4-A. The fall commercial fishing season in Subdistricts 4-B and 4-C will reopen after August 1 by emergency order, and will close either by regulation on September 30, or earlier by emergency order, when the combined fall chum and coho salmon harvest reaches the targeted harvest. The guideline harvest range is 5,000 to 40,000 fall chum and coho salmon for Subdistricts 4-B and 4-C. Based on the preseason projection, the department will be managing for the mid-point to upper end of this range.

District 5

The department will open and close the District 5 commercial salmon season by emergency order. The commercial salmon season will open once the salmon run is distributed throughout the area. Indications of run strength and timing from downstream commercial fishing districts, along with local department test fisheries and subsistence catch reports, will provide run timing and strength information. Unless altered by emergency order, Subdistricts 5-A, 5-B, and 5-C will be open for two 48-hour periods per week during the early season from 6:00 p.m. Tuesday until 6:00 p.m. Thursday, and from 6:00 p.m. Friday until 6:00 p.m. Sunday. Similar to recent years, Subdistrict 5-A, 5-B, and 5-C late season commercial fishing periods will be 24 hours in duration.

For Subdistrict 5-D, the regulatory commercial fishing schedule is seven days per week. However, similar to the last two years, the department will use emergency order authority to reduce the Subdistrict 5-D commercial fishing schedule to 48-hour periods. This will allow the department to monitor and maintain the harvest within the guideline harvest range.

Chinook and Summer Chum Salmon

Subdistricts 5-A, 5-B, and 5-C have a guideline harvest range of 2,400 to 2,800 chinook salmon. The Board of Fisheries established a separate guideline harvest range of 300 to 500 chinook salmon for Subdistrict 5-D. In addition, there is a District 5 guideline harvest range of 1,000 to 3,000 summer chum salmon. Based on preseason projections, the department will be managing for the lower end to mid-point of the chinook salmon, and the lower end of the summer chum salmon guideline harvest ranges. In years with average returns and normal run timing, the first commercial fishing period in Subdistricts 5-A, 5-B, and 5-C should occur between June 25 and July 5.

In Subdistrict 5-D, the first commercial fishing period in years with average returns and normal run timing should occur between July 1 and July 10. The early season in Subdistrict 5-D will close once the lower end to mid-point of the chinook salmon guideline harvest range is reached.

Fall Chum and Coho Salmon

Subdistricts 5-A, 5-B, and 5-C have a guideline harvest range of 4,000 to 36,000 fall chum and coho salmon combined. In years with average returns and normal run timing, the first commercial fishing period should occur in mid-August. Based on preseason projections, the department will be managing for the mid-point to upper end of the fall chum salmon guideline harvest range. It is anticipated that the Subdistrict 5-A, 5-B, and 5-C late season fishery will close when the harvest approaches 32,000 fish.

For Subdistrict 5-D, the Board of Fisheries established a separate guideline harvest range of 1,000 to 4,000 fall chum and coho salmon combined. In years with average returns and normal run timing, the first commercial fishing period in Subdistrict 5-D should occur in early September. The department will close the commercial late season in Subdistrict 5-D on September 30, or earlier, once the harvest reaches approximately 3,000 fish.

District 6

In the spring of 1988, the Board of Fisheries held a special session in Fairbanks to discuss and evaluate the fishery management plan for the Tanana River. At this meeting, the Board of Fisheries instructed the department to continue to manage District 6 on the basis of guideline harvest ranges. However, the Board of Fisheries did sanction managing District 6 as a terminal fishery area. This allows the department to exceed guideline harvest ranges in years when additional commercial fishing will not jeopardize acheiving escapement objectives or meeting subsistence needs.

Currently, the Tanana River in-season run strength and timing indicators include comparative, daily test fish wheel catches near the villages of Manley Hot Springs and Nenana, aerial surveys, and the performance of the commercial, personal use, and subsistence fisheries. Although the newly established Tanana River test fishery program appears to show promise for in-season evaluation of run strength and timing, a limited database of only three years exists for these sites. Additionally, aerial assessment of spawning escapement areas depend on

favorable weather and water conditions. Due to the limited database, the Department will be conservative in allowing harvests to greatly exceed established guideline harvest ranges. In years when no in-season monitoring projects are available, the department will use established guideline harvest ranges in managing District 6 fishery harvest levels.

Chinook and Summer Chum Salmon

The opening of the District 6 chinook and summer chum salmon commercial fishing season will be by emergency order. Since the 1988 season, the department has staggered the opening dates for each subdistrict, with Subdistrict 6-A opening first. The purpose of the delayed season opening and staggered openings for each subdistrict is to allow the early portion of the chinook salmon migration to pass through before commercial fishing begins for later running summer chum salmon.

District 6 has a guideline harvest range of 600 to 800 chinook and 13,000 to 38,000 summer chum salmon. If the pre-season projections are confirmed, the early season is expected to close once the lower end to mid-point of the chinook salmon guideline harvest range or the lower end of the summer chum salmon guideline harvest range is taken. District 6 commercial fishing may resume if there are in-season indications that additional commercial fishing will not jeopardize achieving the chinook and summer chum salmon escapement objectives or meeting subsistence needs.

During years of average run timing, the first commercial fishing period in Subdistrict 6-A normally occurs in early to mid-July. During the early season in District 6, and unless altered by emergency order, there will be two 42-hour commercial fishing periods per week, from 6:00 p.m. Friday until 12:00 noon Sunday, and from 6:00 p.m. Monday until 12:00 noon Wednesday. The department will close the early season by August 10, or earlier.

Fall Chum and Coho Salmon

District 6 has a guideline harvest range of 2,750 to 20,500 fall chum and coho salmon combined. In most years, the entire district has opened by emergency order once the run is distributed throughout the district. Typically, in years of average return size and normal run timing, the first, late season commercial fishing period will occur in early to mid-September. Regulations provide for one 42-hour period in Subdistricts 6-B and 6-C and one 24-hour period in Subdistrict 6-A per week during the late season.

The fall chum salmon return is expected to be average to above average in abundance in 1991. The late commercial fishing season in District 6 will close once the mid-point or upper end of the fall chum salmon guideline harvest range of 2,750 to 15,000 fall chum salmon is harvested. The department may allow additional commercial fishing once the targeted harvest is taken, but only if there are in-season indications that additional commercial fishing will not jeopardize meeting fall chum salmon escapement and subsistence needs.

The coho salmon return is projected to be above average. The migratory timing of coho salmon is somewhat later, but does overlap with the fall chum salmon run. The commercial harvest of coho salmon is a function of the timing, frequency, and

duration of the periods established for the more numerous fall chum salmon. Fall chum salmon will continue to be the primary species of management concern.

Subsistence Fishery

District 4

Subsistence salmon fishing is allowed seven days per week before the opening of the District 4 commercial season. Subsistence salmon fishing is prohibited 24 hours before the opening, and 24 hours after the closure of the commercial salmon season. Beginning 24 hours after the closure of the commercial salmon season, subsistence fishermen may take salmon seven days per week.

Once the District 4 commercial salmon season opens, managers will attempt to make the subsistence fishing schedule coincide with commercial fishing periods. During the commercial salmon season in District 4, subsistence fishermen may take salmon from 6:00 p.m. Sunday until 6:00 p.m. Tuesday, and from 6:00 p.m. Wednesday until 6:00 p.m. Friday, unless altered by emergency order. Additionally, for any commercial salmon fishing closures of greater than five days in duration during the commercial salmon season, subsistence fishermen may take salmon from 6:00 p.m. Sunday until 6:00 p.m. Friday.

District 5

Similar to District 4, before the District 5 commercial salmon season, subsistence fishermen may take salmon seven days per week. Once the commercial fishing season opens in Subdistrict 5-A, 5-B, and 5-C, an attempt will be made to have subsistence fishing periods coincide with the commercial fishing schedule. Additionally, subsistence fishermen may not take salmon 24 hours before the opening, and 24 hours after the closure of the commercial salmon season.

For any commercial salmon fishing closures of greater than five days in duration during the commercial salmon season in Subdistricts 5-A, 5-B, and 5-C, subsistence fishermen may take salmon from 6:00 p.m. Tuesday until 6:00 p.m. Sunday. In Subdistrict 5-D, subsistence fishermen may take salmon seven days per week throughout the season.

In portions of District 5, regulation requires subsistence fishermen to obtain subsistence salmon fishing permits. Permit areas include the Yukon River bridge area from Hess Creek to the Dall River, and the Yukon River drainage upstream of Fort Yukon to the Canadian border. Permits are available at the Department of Fish and Game office in Fairbanks. Regulations require all permit holders to report harvest information at the end of the fishing season.

District 6

Regulations require subsistence salmon fishermen in the Tanana River drainage to obtain subsistence permits. Permits are available at the Department of Fish and Game office in Fairbanks. Subsistence permit holders fishing in the upper

portion of Subdistrict 6-B and all of Subdistrict 6-C are required to report the number of salmon taken to the department each week. All other Tanana River permit holders are required to report harvest information at the end of the fishing season.

During the entire fishing season in Subdistricts 6-B and 6-C, subsistence fishermen may take salmon from 6:00 p.m. Monday until 12 noon Wednesday, and from 6:00 p.m. Friday until 12 noon Sunday, unless altered by emergency order.

In Subdistrict 6-A, subsistence fishermen may take salmon from 6:00 p.m. Monday until 12 noon Wednesday, and from 6:00 p.m. Friday until 12 noon Sunday, however, the department will change the subsistence fishing schedule to one 24-hour period and a second 60-hour period each week during the late commercial season. This management strategy is necessary due to the Board of Fisheries actions in February 1990 which reduced the late season commercial fishing time in Subdistrict 6-A to no more than one 24-hour period per week. The total hours available to subsistence salmon fishing each week will not change.

Additionally, in the subdistrict adjacent to the Fairbanks area, Subdistrict 6-C, there is a fishery harvest limit. The subsistence fishery harvest limit in Subdistrict 6-C is 750 chinook salmon, 5,000 summer chum salmon, and 5,200 fall chum and coho salmon combined. Once this harvest limit is reached, the subsistence salmon fishery in Subdistrict 6-C will be closed.

Personal Use Fishery

Although all Alaska residents now qualify as subsistence users, personal use regulations remain in effect. Fishermen may still take salmon under the personal use regulations. Permits are available from the Alaska Department of Fish and Game. Personal use regulations and subsistence fishing regulations are very similar, with some additional personal use restrictions. For example, personal use regulations restrict fishermen in the Tanana River to a permit harvest limit of 10 chinook and 75 summer chum salmon before August 15, and 75 fall chum and coho salmon combined after August 15.

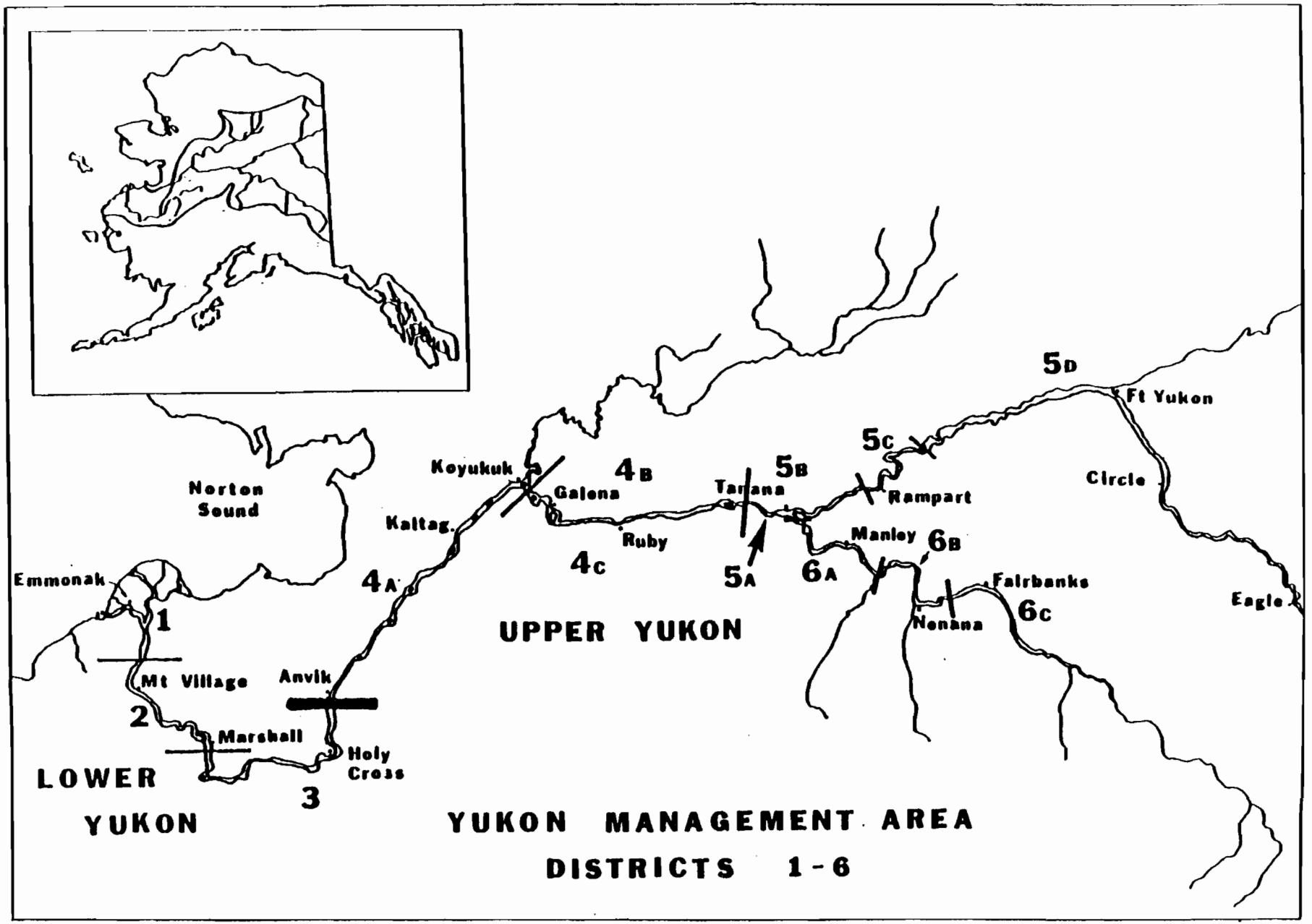

Figure 1. Yukon River management area, Districts 1 - 6, Alaska.

Table 1. Alaskan commercial sales of Yukon River salmon, 1961-1990. a

Year	Chinook		Summer Chum		Fall Chum		Coho	
	Numbers	Roe	Numbers	Roe b	Numbers	Roe c	Numbers	Roe
1961	119,664	-	-	-	42,461	-	2,855	-
1962	94,734	-	-	-	53,116	-	22,926	-
1963	117,048	-	-	-	0	-	5,572	-
1964	93,587	-	-	-	8,347	-	2,446	-
1965	118,098	-	-	-	23,317	-	350	-
1966	93,315	-	-	-	71,045	-	19,254	-
1967	129,656	-	10,935	-	38,274	-	11,047	-
1968	106,526	-	14,470	-	52,925	-	13,303	-
1969	91,027	-	61,966	-	131,310	-	15,093	-
1970	79,145	-	137,006	-	209,595	-	13,188	-
1971	110,507	-	100,090	-	189,594	-	12,203	-
1972	92,840	-	135,668	-	152,176	-	22,233	-
1973	75,353	-	285,509	-	232,090	-	36,641	-
1974	98,089	-	589,892	-	289,776	-	16,777	-
1975	63,838	-	710,295	-	275,009	-	2,546	-
1976	87,776	-	600,894	-	156,390	-	5,184	-
1977	96,757	-	534,875	-	257,986	-	38,863	-
1978	99,168	-	1,052,226	25,761	236,383	10,628	26,152	-
1979	127,673	-	779,316	40,217	359,946	18,466	17,165	-
1980	153,985	-	928,609	139,106	293,430	5,020	8,745	-
1981	158,018	-	1,006,938	189,068	466,451	11,285	23,680	-
1982	123,644	-	461,403	152,819	224,187	805	31,176	-
1983	147,910	-	744,879	149,999	302,598	5,064	13,320	-
1984	119,904	-	588,597	167,224	208,232	2,328	81,940	-
1985	146,188	-	516,997	248,625	267,744	2,525	57,672	-
1986	99,970	-	721,469	271,691	139,442	577	47,255	-
1987	134,760 d	-	442,238	121,968	0	0	0	-
1988 e	101,421	-	1,152,237	256,535	133,975	3,227	86,612	-
1989 e	101,840	-	959,994	288,549	270,195	14,749	83,353	-
1990 e	95,361	1,731	305,518	109,376	123,921	10,801	41,745	3,888
5 Yr Avg 1985-89 Alaska	116,836		758,587	237,474	162,271	4,216	54,978	
5 Yr Avg 1985-89 Lower Yukon	110,195		699,031	0	111,930	0	46,320	
5 Yr Avg 1985-89 Upper Yukon	6,641		59,556	237,474	50,342	4,216	8,659	

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.
c May include small amounts of coho salmon roe.
d Includes illegal sales of fish in Districts 5 and 6.
e Does not include District 6 test fishing sales.

Table 2. Alaskan subsistence catch of Yukon River salmon, 1961-1990.

Year	Chinook	Summer Chum a	Fall Chum a,b	Coho a,b	Total
1961	21,488	305,317	101,772	9,192	437,769
1962	11,110	261,856	87,285	9,480	369,731
1963	24,862	297,094	99,031	27,699	448,686
1964	16,231	361,080	120,360	12,187	509,858
1965	16,608	336,848	112,283	11,789	477,528
1966	11,572	154,508	51,503	13,192	230,775
1967	16,448	206,233	68,744	17,164	308,589
1968	12,106	133,880	44,627	11,613	202,226
1969	14,000	156,191	52,063	7,776	230,030
1970	13,874	166,504	55,501	3,966	239,845
1971	25,684	171,487	57,162	16,912	271,245
1972	20,258	108,006	36,002	7,532	171,798
1973	24,317	161,012	53,670	10,236	249,235
1974	19,964	227,811	93,776	11,646	353,197
1975	13,045	211,888	86,591	20,708	332,232
1976	17,806	186,872	72,327	5,241	282,246
1977	17,581	159,502	82,771	16,333	276,187
1978	30,297	197,144	94,867	7,787	330,095
1979	31,005	196,187	233,347	9,794	470,333
1980	42,724	272,398	172,657	20,158	507,937
1981	29,690	208,284	188,525	21,228	447,727
1982	28,158	260,969	132,897	35,894	457,918
1983	49,478	240,386	192,928	23,895	506,687
1984	42,428	230,747	174,823	49,020	497,018
1985	39,771	264,828	206,472	32,264	543,335
1986	45,238	290,825	164,043	34,468	534,574
1987	53,124	275,914	361,663 c	84,894 c	775,595
1988	46,590	311,724	159,703	69,138	587,155
1989	51,280	249,582	218,539	40,977	560,378
1990 d					
5 Yr Avg 1985-89 Alaska	47,201	278,575	185,571 e	52,348	600,207
5 Yr Avg 1985-89 Lower Yukon	15,353	72,556	23,590	11,765	123,264
5 Yr Avg 1985-89 Upper Yukon	31,848	206,019	161,981	40,583	476,943

a Catches estimated for 1961-1976 since catches of salmon other than chinook salmon were not differentiated by species until 1977.
b Minimum estimates for 1961-1978 because surveys were typically conducted well before the end of the fishing season.
c Includes estimates of catches (182,567 fish) from illegal salmon and salmon roe sales in Districts 5 and 6.
d Data not available yet.
e Does not include estimate of illegal sales (182,567 fish) in five year (1985-1989) average.

Table 3. Canadian catch of Yukon River chinook and fall chum salmon, 1961-1990.

Year	Chinook			Fall Chum		
	Commercial	Non-Commercial a	Total	Commercial	Non-Commercial a,b	Total
1961	3,446	9,800	13,246	3,276	5,800	9,076
1962	4,037	9,900	13,937	936	8,500	9,436
1963	2,283	7,794	10,077	2,196	25,500	27,696
1964	3,208	4,200	7,408	1,929	10,258	12,187
1965	2,265	3,115	5,380	2,071	9,718	11,789
1966	1,942	2,510	4,452	3,157	10,035	13,192
1967	2,187	2,963	5,150	3,343	13,618	16,961
1968	2,212	2,830	5,042	453	11,180	11,633
1969	1,640	984	2,624	2,279	5,497	7,776
1970	2,611	2,052	4,663	2,479	1,232	3,711
1971	3,178	3,269	6,447	1,761	15,150	16,911
1972	1,769	3,960	5,729	2,532	5,000	7,532
1973	2,199	2,323	4,522	2,806	7,329	10,135
1974	1,808	3,823	5,631	2,544	9,102	11,646
1975	3,000	3,000	6,000	2,500	18,100	20,600
1976	3,500	1,525	5,025	1,000	4,200	5,200
1977	4,720	2,807	7,527	3,990	8,489	12,479
1978	2,975	2,906	5,881	3,356	6,210	9,566
1979	6,175	4,200	10,375	9,084	13,000	22,084
1980	9,500	13,046	22,546	9,000	13,218	22,218
1981	8,593	9,216	17,809	15,260	7,021	22,281
1982	8,640	8,568	17,208	11,312	4,779	16,091
1983	13,027	5,925	18,952	25,990	3,500	29,490
1984	9,885	6,910	16,795	22,932	6,335	29,267
1985	12,573	6,728	19,301	35,746	5,519	41,265
1986	10,797	9,567	20,364	11,464	3,072	14,536
1987	10,864	6,800	17,664	40,591	3,889	44,480
1988	13,217	8,210	21,427	30,263	3,302	33,565
1989	9,789	8,155	17,944	17,549	5,471	23,020
1990 c	11,292	7,533	18,824	27,207	7,600	34,807
5 Yr Avg 1985-89	11,448	7,892	19,340	27,123	4,251	31,373

a Indian Food Fish, Domestic, and Sport fisheries combined.
b Includes small numbers of coho salmon taken at Old Crow.
c Preliminary estimates.

Table 4. Chinook salmon escapement counts for selected Alaskan spawning stocks in the Yukon River drainage, 1961-1990. a

	Andreafsky River		Anvik River b				Chena River		Salcha River	
Year	East Fork	West Fork	Aerial	Tower	Nulato River	Gisasa River	River	Index g	River	Index h
1961	1,003	-	1,226	-	543 c	266 c	-	-	2,878	-
1962	675 c	762 c	-	-	-	-	61 c,d	-	937	-
1963	-	-	-	-	-	-	137 c	-	-	-
1964	867	705	-	-	-	-	-	-	450	-
1965	-	344 c	650 c	-	-	-	-	-	408	-
1966	361	303	638	-	-	-	-	-	800	-
1967	-	276 c	336 c	-	-	-	-	-	-	-
1968	380	383	310 c	-	-	-	-	-	739	-
1969	274 c	231 c	296 c	-	-	-	-	-	461 c	-
1970	665	574 c	368	-	-	-	6 c	-	1,882	-
1971	1,904	1,682	-	-	-	-	193 c,d	-	158 c	-
1972	798	582 c	-	1,198	-	-	138 c,d	-	1,193	1,034
1973	825	788	-	613	-	-	21 c	-	391	-
1974	-	285	-	471 c	78 c	161	1,016 d	959	1,857	1,620
1975	993	301	-	730	204	385	316 d	262 d	1,055	-
1976	818	643	-	1,153	648	332	531	496	1,641	1,473
1977	2,008	1,499	-	1,371	487 c	255	563	-	1,202	1,052
1978	2,487	1,062	-	1,324	920	45 c	1,726	-	3,499	3,258
1979	1,180	1,134	-	1,484	1,507	484	1,159 c	-	4,789	-
1980	958 c	1,500	1,192	-	1,323 c	951	2,541	-	6,757	6,126
1981	2,146 c	231 c	577 c	-	791 c	-	600 c	-	1,237 c	1,121
1982	1,274	851	-	-	-	421	2,073	-	2,534	2,346
1983	-	-	376 c	-	1,006	572	2,553	2,336	1,961	1,803
1984	1,573 c	1,993	574 c	-	-	-	501	494	1,031	906
1985	1,617	2,248	720	-	2,780	735	2,553	2,262	2,035	1,860
1986	1,954	3,158	918	-	2,974	1,346	2,031	1,935	3,368	-
1987	1,608	3,281	879	-	1,638	731	1,312	1,209 c	1,898	1,671
1988	1,020	1,448	1,449	-	1,775	797	1,966	1,760	2,761	2,553
1989	1,399	1,089	212 c	-	-	-	1,280	1,185	2,333	2,136
1990	2,503	1,545	1,595	-	998	884 c	1,436	1,402 c	3,744	3,429
E.O. e	1,600	1,000	500 f	-	1,000	650		1,700		2,500

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.

b From 1961-1970, aerial survey count data are from various segments of the mainstem Anvik River.
From 1971-1979, mainstem aerial survey counts below the tower were added to tower counts.
From 1980-present, aerial survey counts are from the mainstem Anvik River between the Yellow River and McDonald Creek.

c Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.

d Boat Survey.

e Interim escapement objective.

f Interim escapement objective for the mainstem Anvik River between the Yellow River and McDonald Creek.

g Chena River index area for assessing escapement objectives is from Moose Creek Dam to Middle Fork River.

h Salcha River index area for assessing escapement objectives is from TAPS crossing to Caribou Creek.

Table 5. Chinook salmon escapement counts for selected Canadian spawning stocks in the Yukon River drainage, 1961-1990. a

Year	Tincup Creek	Tatchun River b	Little Salmon River	Big Salmon River d	Nisutlin River e	Wolf River f	Whitehorse Fishway g	Mainstem Tagging Estimate h
1961	-	-	-	-	-	-	1,068	-
1962	-	-	-	-	-	-	1,500	-
1963	-	-	-	-	-	-	483	-
1964	-	-	-	-	-	-	595	-
1965	-	-	-	-	-	-	903	-
1966	-	7 c	-	-	-	-	563	-
1967	-	-	-	-	-	-	533	-
1968	-	-	173 c	857 c	407 c	-	414	-
1969	-	-	120	286	105	-	334	-
1970	-	100	-	670	615	71 c	625	-
1971	-	130	275	275	650	750	856	-
1972	-	80	126	415	237	13	391	-
1973	100	99	27 c	75 c	36 c	-	224	-
1974	-	192	-	70 c	48 c	-	273	-
1975	-	175	-	153 c	249	40 c	313	-
1976	-	52	-	86 c	102	-	121	-
1977	-	150	408	316 c	77	-	277	-
1978	-	200	330	524	375	-	725	-
1979	-	150	489 c	632	713	183 c	1,184	-
1980	-	222	286 c	1,436	975	377	1,383	-
1981	-	133	670	2,411	1,626	395	1,555	-
1982	-	73	403	758	578	104	473	19,790
1983	100	264	101 c	540	701	95	905	28,989
1984	150	161	434	1,044	832	124	1,042	27,616 i
1985	210	190	255	801	409	110	508	10,730
1986	228	155	54 c	745	459 c	109	557	16,415
1987	100	159	468	891	183	35	327	13,210
1988	204	152	368	765	267	66	405	23,118
1989	88	100	862	1,662	695	146	549	25,201
1990	83	643	665	1,806	652	188	1,407	38,678
E.O. j								33,000-43,000

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
b All foot surveys except 1978 (boat survey) and 1986 (aerial survey).
c Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
d For 1968, 1970, and 1971 counts are from mainstem Big Salmon River. For all other years counts are from the mainstem Big Salmon River between Big Salmon Lake and the vicinity of South Creek.
e One Hundred Mile Creek to Sidney Creek.
f Wolf Lake to Red River.
g Includes 50, 90, and 292 fin-clipped hatchery-origin salmon in 1988, 1989, and 1990, respectively.
h Estimated total spawning escapement excluding Porcupine River (estimated border escapement minus the Canadian catch.
i Estimate derived by dividing the 1984 5-area (Whitehorse Fishway, Big Salmon, Nisutlin, Wolf, Tatchun) by the average proportion of the 5-area index count to the estimated spawning escapements from the DFO tagging study for years 1982, 1983, and 1985-1989.
j Interim escapement objective.

Table 6. Summer chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1973-1990. a

Year	Andreafsky River: East Fork Aerial	Andreafsky River: East Fork Sonar or Tower	Andreafsky River: West Fork	Anvik River	Nulato River	Gisasa River	Hogatza River	Chena River	Salcha River
1973	10,149 b	-	51,835	86,665 b,e	-	-	-	-	-
1974	3,215 b	-	33,578	201,277 e	51,160	-	-	-	3,510
1975	223,485	-	235,954	845,485 e	138,495	-	22,355	-	7,573
1976	105,347	-	118,420	406,166 e	40,001 b	-	20,744	-	6,474
1977	112,722	-	63,120	262,854 e	69,660	-	10,734	-	677 b
1978	127,050	-	57,321	251,339 e	54,480	9,280 b	5,102	1,609	5,405
1979	66,471	-	43,391	280,537 c	37,104	10,962	14,221	1,025 b	3,060
1980	36,823 b	-	115,457	492,676 c	14,946 b	10,388	19,786	338	4,140
1981	81,555	147,312 c	-	1,479,582 c	14,348 b	-	-	3,500	8,500
1982	7,501 b	181,352 c	7,267 b	444,581 c	-	334 b	4,984 b	1,509	3,756
1983	-	110,608 c	-	362,912 c	21,012 b	2,356 b	28,141	1,097	716 b
1984	95,200 b	70,125 c	238,565	891,028 c	-	-	-	1,861	9,810
1985	66,146	-	52,750	1,080,243 c	29,838	13,232	22,566	1,005	3,178
1986	83,931	167,614 d	99,373	1,189,602 c	64,265	12,114	-	1,509	8,028
1987	6,687 b	45,221 d	35,535	455,876 c	11,257	2,123	5,669 b	333	3,657
1988	43,056	68,937 d	45,432	1,125,449 c	42,083	9,284	6,890	432	2,889 b
1989	21,460 b	-	-	636,906 c	-	-	-	714 b	1,574 b
1990	11,519 b	-	20,426 b	403,627 c	4,615 b	450 b	2,177 b	-	450 b
E.O. f	109,000	-	116,000	487,000	-	-	17,000 g	-	3,500

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.

b Incomplete survey and/or poor survey timing or conditions resulted in minimal or inaccurate count.

c Sonar count.

d Tower count.

e Tower count plus aerial survey count below tower.

f Interim escapement objective.

g Interim escapement objective includes Clear Creek (8,000) and Caribou Creek (9,000).

Table 7. Fall chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1974-1990.

Year	Delta River a	Toklat River b	Chandalar River c	Sheenjek River d	Fishing Branch River e	Canada Mainstem Tagging Estimate f
1974	5,915	43,484	-	89,966	32,525 g	-
1975	3,734 h	90,984	-	173,371	353,282 g	-
1976	6,312 h	53,882	-	26,354	36,584	-
1977	16,876 h	36,462	-	45,544	88,400	-
1978	11,136	37,057	-	32,449	40,800	-
1979	8,355	179,627	-	91,372	119,898	-
1980	5,137	26,373	-	28,933	55,268	-
1981	23,508	15,775	-	74,560	57,386 i	-
1982	4,235	3,601	-	31,421 c	15,901	31,958
1983	7,705	20,807	-	49,392 c	27,200	90,875
1984	12,411	16,511	-	27,130 c	15,150	56,633 j
1985	17,276 h	22,805	-	152,768 c	56,016 g	62,010
1986	6,703 h	18,903	59,313	83,197 c	31,378 g	87,990
1987	21,180	22,141	52,416	140,086 c	48,956 g	80,776
1988	18,024	13,324	33,619	41,073 c	23,597 g	36,786
1989	21,342 h	30,447	69,161	101,748 c	43,834 g	35,750
1990	8,992 h	33,672	78,631	65,721 c	27,000 m	49,849
E.O. k	11,000	33,000	-	62,000	50,000 -120,000	-

a Total escapement estimates made from migratory time density curve (see Barton 1986), unless otherwise indicated.

b Total escapement estimates using Delta River migratory time density curve and percentage of live salmon present by survey date in the upper Toklat River area.

c Sonar estimate.

d Total escapement estimates using sonar to aerial survey expansion factor of 2.221, unless otherwise indicated.

e Total escapement estimates using weir to aerial survey expansion factor of 2.72, unless otherwise indicated.

f Estimated total spawning estimates excluding Porcupine-Fishing Branch Rivers (estimated border escapement minus Canadian removal).

g Weir estimate.

h Population estimate from replicate foot surveys and stream life data.

i Initial aerial survey count was doubled before applying the weir/aerial expansion factor of 2.72 since only half of the spawning area was surveyed.

j Escapement estimate based on mark-recapture program unavailable. Estimate based on assumed average exploitation rate.

k Interim escapement objective.

m Weir was not operated. Total escapement estimate using weir to aerial survey expansion factor of 3.57. Survey was conducted approximately 2 weeks late, therefore, a more reasonable estimate would be between 30,000 and 40,000 fish.

Table 8. Coho salmon escapement counts for selected spawning areas in the Yukon River drainage, 1972-1990. a

Year	Nenana River Drainage				Delta Clearwater River d,e	Clearwater Lake and Outlet	Richardson Clearwater River
	Lost Slough	Clear Creek	Wood Creek b	17 Mile Slough			
1972	-	-	-	-	632	417	454 g
1973	-	-	-	-	3,322	551 d	375 d
1974	1,388	-	-	27	3,954	560	652 d
1975	943	-	-	956	5,100	1,575 d,e	4 g
1976	118	13	-	281	1,920	1,500 d,e	80 g
1977	524	-	310 c	1,167	4,793	730 d,e	327
1978	350	-	300 c	466	4,798	570 d,e	-
1979	227	-	-	1,987	8,970	1,015 d,e	372
1980	499	-	1,603 c	592	3,946	1,545 d,e	611
1981	274	-	849 h	1,005	8,563 f	459 g	550
1982	-	-	1,436 h	-	8,365 f	-	-
1983	766	-	1,044 h	103	8,019 f	253	88
1984	2,677	2,600 b,e	8,805 h	-	11,061	1,368	428
1985	1,584	-	3,775 h	2,081	5,358	750	-
1986	794	605 b,e	1,664 h	218 b,e	10,857	3,577	146 g
1987	2,511	-	2,450 h	3,802	22,300	4,225 d,e	-
1988	348	-	2,046 h	-	21,600	825 d,e	-
1989	-	-	412 h	824 g	11,000	1,600 d,e	483
1990	688	-	-	15 g	8,325	2,375 d,e	-

a Only peak counts presented. Survey rating is fair to good, unless otherwise noted.

b Surveyed by F.R.E.D.

c Foot survey.

d Surveyed by Sport Fish Division.

e Boat survey.

f Population estimate.

g Poor survey.

h Weir count.